

REMARKS

The Office Action mailed May 2, 2007 has been received and reviewed. Claims 1-4 and 8 are currently pending in the application. Claims 1-4 and 8 were rejected. Applicant has amended independent claim 1 herein, and respectfully requests reconsideration of the application as amended herein.

35 U.S.C. § 102(b) Anticipation Rejections

Anticipation Rejection Based on U.S. Patent No. 6,319,317 to Takamori

Claims 1-3 and 8 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Takamori (U.S. Patent No. 6,319,317). Applicant respectfully traverses this rejection, as hereinafter set forth.

“A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.” M.P.E.P. § 2131 (Aug. 2001) (*quoting Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987)). “The identical invention must be shown in as complete detail as is contained in the . . . claim.” *Id.* (*quoting Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1051, 1053 (Fed. Cir. 1987)). In addition, “the reference must be enabling and describe the applicant’s invention sufficiently to have placed it in possession of a person of ordinary skill in the field of the invention.” *In re Paulsen*, 30 F.3d 1475, 1479, 31 USPQ2d 1671, 1673 (Fed. Cir. 1994).

Applicant submits that the Takamori reference does not and cannot anticipate under 35 U.S.C. § 102 the presently claimed invention of independent claim 1, and claims 2-3 and 8 depending therefrom, because the Takamori reference does not describe, either expressly or inherently, the identical inventions in as complete detail as are contained in the claims.

In the Advisor Action of January 30, 2007, the Examiner characterized the Takamori reference by stating:

... Takamori is [] a platform, a sensing system and a deposition system. These elements directly correspond to the claimed elements. Furthermore, *the sensing system [of Takamori] operates to ensure a proper spreading by control of the deposition and the spinning (i.e., the deposition operation) such that thickness of the deposit is*

controlled (see the citations in the prior office action). (Advisory Action, continuation sheet; emphasis added.)

In the Office Action of May 2, 2007, the Examiner, regarding the disclosure of the Takamori reference, alleges:

The [Takamori] sensor measures the “spreading state” and therefore is a continuous measurement system. The apparatus can operate on the claimed die and claimed surfaces. This measurement is considered to be a direct measurement in the context of applicant’s direct measurement, which is measuring the surface data of the substrate and dispense by a transmitter and receiver (as describe in applicant’s own specification 0042). ***Since Takamori is a sensor with a transmitter and receiver, and applicant’s sensor is a transmitter and receiver, it anticipates the claim.*** (Office Action, p. 3; emphasis added.)

Applicant respectfully disagrees that the Takamori reference anticipates Applicant’s invention as claimed in amended independent claim 1 which reads:

1. A system for selectively depositing a material on a previously formed workpiece, comprising:
 - a platform for supporting the workpiece including a semiconductor die during a deposition process;
 - a sensing system configured to measure over the semiconductor die both an upper surface including a previous material previously deposited thereon and to continuously directly measure a surface level of a material being deposited on the upper surface according to direct measurements in a dimension substantially orthogonal to the semiconductor die* until the surface level of the material is directly measured to be a specific thickness of the material; and
 - a deposition system for depositing the material on the workpiece to the specific thickness as monitored by the sensing system. (Emphasis added.)

Applicant respectfully asserts that the Takamori reference cannot anticipate under 35 U.S.C. § 102 Applicant’s invention as presently claimed in amended independent claim 1 because the Takamori reference does not describe, either expressly or inherently, the identical inventions in as complete detail as are contained in the claims. Since the Takamori reference does not describe, either expressly or inherently, the identical inventions in as complete detail as are contained in the claims, the Takamori reference cannot anticipate under 35 U.S.C. § 102 the presently claimed invention of independent claim 1, and claims 2 and 4 depending therefrom.

The Advisory Action concedes that the “sensing system” of the Takamori reference *detects the outline of the material being deposited*. Specifically, the Takamori reference’s alleged “sensing system (Figure 4, item 105) discloses a camera that detects the outline of the periphery of the resist solution spreading across a wafer to determine if the spreading state is acceptable (i.e., generally circular) or if the resist has an improper consistency resulting in undesirable spreading (i.e., varying radius or wave-like periphery) known as a “scratchpad.” At most, the Takamori “sensing system” “estimates” or “calculates” not “*continuously directly measure a surface level of a material ... according to direct measurements in a dimension substantially orthogonal to the semiconductor die*”, as claimed by Applicant. Again, the Takamori “sensing system” discloses measurement of an area about which a known volume of material is distributed and not a sensing system “**configured ... to continuously directly measure a surface level of a material ... according to direct measurements in a dimension substantially orthogonal to the semiconductor die**” as claimed by Applicant.

Specifically, the Takamori reference discloses:

- ... detecting sensor 105 for detecting a spreading state of an outline of the outer periphery of the resist solution when the resist solution is discharged onto almost the center of the rotated wafer W and the resist solution spreads out from almost the center of the wafer W toward the outer edge. As this detecting sensor 105, for example, a CCD camera can be used. (Takamori, col. 8, lines 30-36).
- ... the spreading state of the outline of the outer periphery of the resist solution R is detected by the detecting sensor 105 such as a CCD camera or the like (Takamori, col. 9, lines 44-46).

The “sensing system” of the Takamori reference clearly is not “**configured ... to continuously directly measure a surface level of a material ... according to direct measurements in a dimension substantially orthogonal to the semiconductor die**” as claimed by Applicant. Therefore, the Takamori reference cannot anticipate under 35 U.S.C. § 102 Applicant’s invention as presently claimed in amended independent claim 1 from which claims 2-3 and 8 depend. Accordingly, Applicant respectfully requests the rejections be withdrawn.

35 U.S.C. § 103(a) Obviousness Rejections

Obviousness Rejection Based on U.S. Patent No. 6,319,317 to Takamori and U.S. Patent No. 6,270,579 to Subramanian

Claims 1 through 3 and 8 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Takamori (U.S. Patent No. 6,319,317) and Subramanian et al. (U.S. Patent No. 6,270,579). Applicant respectfully traverses this rejection, as hereinafter set forth.

To establish a *prima facie* case of obviousness the prior art reference (or references when combined) **must teach or suggest all the claim limitations**. *In re Royka*, 490 F.2d 981, 985 (CCPA 1974); *see also* MPEP § 2143.03. Additionally, there must be “a reason that would have prompted a person of ordinary skill in the relevant field to combine the [prior art] elements” in the manner claimed. *KSR Int’l Co. v. Teleflex Inc.*, 127 S. Ct. 1727, 1742, 167 L.Ed.2d 705, 75 USLW 4289, 82 U.S.P.Q.2d 1385 (2007). Finally, to establish a *prima facie* case of obviousness there must be a reasonable expectation of success. *In re Merck & Co., Inc.*, 800 F.2d 1091, 1097 (Fed. Cir. 1986). Furthermore, the reason that would have prompted the combination and the reasonable expectation of success must be found in the prior art, common knowledge, or the nature of the problem itself, and not based on the Applicant’s disclosure. *DyStar Textilfarben GmbH & Co. Deutschland KG v. C. H. Patrick Co.*, 464 F.3d 1356, 1367 (Fed. Cir. 2006); MPEP § 2144. Underlying the obvious determination is the fact that statutorily prohibited hindsight cannot be used. *KSR*, 127 S.Ct. at 1742; *DyStar*, 464 F.3d at 1367.

The 35 U.S.C. § 103(a) obviousness rejections of claims 1 through 3 and 8 are improper because the elements for a *prima facie* case of obviousness are not met. Specifically, the rejection fails to meet the criterion that the prior art reference must teach or suggest all the claims limitations.

Applicant respectfully asserts that neither the Takamori reference nor the Subramanian reference, either individually or in any proper combination, teach or suggest Applicant’s invention as presently claimed in amended independent claim 1.

The Office Action continues to cite the Takamori reference for the alleged teachings as stated above with reference to the 35 U.S.C. § 102 rejections, however, the Office Action concedes:

It can be argued that the Takamori does not go as far as applicant does in defining the sensor techniques, especially with respect to how the sensor measures the thickness. However, Subramanian disclose further details of a sensor that monitors the surface and spreading state of a dispense. The sensor includes a transmitter (item 68) driven by light driver 66, which is directed towards the substrate surface and generates thickness uniformity data which is received by receiver 70 which feeds into measurement system 72 (see column 6, lines 31-59). *This [Subramanian] sensor **directly measures a surface level of the material being deposited** on the upper surface until the surface level of the material is directly measured to be a specific thickness of the material* (as shown in step 210 of Figure 7, and see column 9, lines 30-35 (Office Action pp. 5-6; emphasis added.)

Applicant respectfully asserts that Subramanian reference does not teach “*directly measur[ing] ... material being deposited ... until the surface level of the material is directly measured to be a specific thickness*” as alleged in the Office Action. At the Office Action’s specific citation of column 9, lines 30-35 and the teachings immediately preceding the citation of the Subramanian reference, it is very clear that the Subramanian reference teaches *measuring material that has ceased to be deposited* as the material being measured is “developed” in a preceding step 190 of the Subramanian reference’s Figure 7. Specifically, the Subramanian reference teaches:

The measurement system 72 then *measures the thickness of the developed photoresist material layer 50* on the wafer 52 at various locations along the wafer 52 in step 200. In step 210, the processor 64 compares the measured thickness uniformity with the desired thickness uniformity, and determines whether or not the proper thickness uniformity has been achieved within predefined tolerances. If no, the processor 64 enters a routine to reconfigure the path in step 215. In step 220, the processor 64 stores the previous or reconfigured path values to be used for the next wafer. (Subramanian, col. 9, lines 26-36; emphasis added.)

Clearly the Subramanian reference, like the Takamori reference argued above, also fails to teach or suggest Applicant’s claim element of “*a sensing system configured to measure over the semiconductor die both an upper surface including a previous material previously deposited thereon and to continuously directly measure a surface level of a material being deposited on the upper surface according to direct measurements in a dimension substantially orthogonal to the semiconductor die until the surface level of the material is directly measured to be a*

specific thickness of the material” as recited in Applicant’s amended independent claim 1.

Therefore, since neither the Takamori reference nor the Subramanian reference teach or suggest Applicant’s claimed invention including “*a sensing system configured to measure over the semiconductor die both an upper surface including a previous material previously deposited thereon and to continuously directly measure a surface level of a material being deposited on the upper surface according to direct measurements in a dimension substantially orthogonal to the semiconductor die until the surface level of the material is directly measured* to be a specific thickness of the material” these references, either individually or in any proper combination, cannot render obvious, under 35 U.S.C. §103, Applicant’s invention as presently claimed in amended independent claim 1. Accordingly, Applicant respectfully requests the rejection of presently amended independent claim 1 be withdrawn.

The nonobviousness of independent claim 1 precludes a rejection of claims 2, 3 and 8 which depend therefrom because a dependent claim is obvious only if the independent claim from which it depends is obvious. *See In re Fine*, 5 U.S.P.Q.2d 1596, 1600 (Fed. Cir. 1988), *see also* MPEP § 2143.03. Therefore, the Applicant requests that the Examiner withdraw the 35 U.S.C. § 103(a) obviousness rejection to independent claim 1 and claims 2, 3 and 8 which depend therefrom.

Obviousness Rejection Based on U.S. Patent No. 6,319,317 to Takamori OR Takamori and U.S. Patent No. 6,270,579 to Subramanian as applied to claims 1-3 and 8 above, and further in view of U.S. Patent No. 6,642,155 to Whitman

Claim 4 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Takamori (U.S. Patent No. 6,319,317) OR Takamori and Subramanian et al. (U.S. Patent No. 6,270,579) as applied to claims 1-3 and 8 above, and further in view of Whitman (U.S. Patent No. 6,642,155). Applicant respectfully traverses this rejection, as hereinafter set forth.

The nonobviousness of independent claim 1 precludes a rejection of claim 4 which depends therefrom because a dependent claim is obvious only if the independent claim from which it depends is obvious. *See In re Fine*, 5 U.S.P.Q.2d 1596, 1600 (Fed. Cir. 1988), *see also* MPEP § 2143.03. Therefore, Applicant requests that the Examiner withdraw the 35 U.S.C. §

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103(a) obviousness rejection to dependent claim 4 as independent claim 1 is allowable.

CONCLUSION

Claims 1 through 4 and 8 are believed to be in condition for allowance, and an early notice thereof is respectfully solicited. Should the Examiner determine that additional issues remain which might be resolved by a telephone conference, the Examiner is respectfully invited to contact Applicant's undersigned attorney.

Respectfully submitted,



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Date: July 31, 2007
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